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Tree canopy light interception estimates in almond and a walnut orchards using ground, low flying aircraft, and satellite based methods to improve irrigation scheduling programs.

Canopy light interception is a main driver of water use and crop yield in almond and walnut production. Fractional green canopy cover (Fc) is a good indicator of light interception and can be estimated remotely from satellite using the normalized difference vegetation index (NDVI) data. Satellite-based Fc estimates could be used to inform crop evapotranspiration models, and hence support improvements in irrigation evaluation and management capabilities. Satellite estimates of Fc in almond and walnut orchards, however, need to be verified before incorporating them into irrigation scheduling or other crop water management programs. In this study, Landsat-based NDVI and Fc from NASA's Satellite Irrigation Management Support (SIMS) were compared with four estimates of canopy cover: 1. light bar measurement, 2. in-situ and image-based dimensional tree-crown analyses, 3. high-resolution NDVI data from low flying aircraft, and 4. orchard photos obtained via Google Earth and processed by an Image J thresholding routine. Correlations between the various estimates are discussed.

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